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Generating and Understanding Jokes by Five- And Nine-Year-Olds as an Expression of Theory of Mind

The main aim of the presented research is to describe children's ability to generate and understand humorous stories and pictures drawn by their peers and older or younger children. From the perspective of research on children's theories of mind, we assume that in middle childhood we will observe a transition from the basic, copy theory of mind to the interpretative one (Carpendale & Chandler, 1996). We examined 60 five- and nine-year-old children in two phases. During the first phase, the children were asked to draw a funny picture and then justify what made it funny and they had also to present the funny story. Two months later, the children were presented with some pictures chosen after the first phase as the most typical one. They had to justify why these pictures are funny. The obtained results indicate that there is a relation between the age of the subjects and the kind of interpretations of funny pictures which are consistent with the author's intentions. Significantly more nine-year-olds than five-year-olds accurately understood the author's intentions when interpreting his picture. The presented data indicate that changes in the theory of mind take place also in middle childhood and lead to a complex, interpretative theory of mind which can be discovered when researching children's understanding of jokes.

Key words: humor, ambiguous material, theory of mind, understanding intentions

Introduction

Research on children's theories of mind reveal that children's knowledge about the mind changes significantly not only during a transition period at about 4 years of age, when a child starts to understand false beliefs, but also develops intensively during middle childhood. Firstly, a more important tendency in the development of knowledge about the mind is the continuous progress in awareness that a human mind has a constructive, interpretative and subjective nature (Carpendale, Chandler, 1996; Kuhn, 2000). Secondly, the development of cognitive and linguistic skills enables a child to construct rich and complex systems of propositions to justify or explain others people's behavior (Pillow, 2008). Searching development of a child's knowledge about the mind in middle childhood, we need to create tasks that allow us to check if a child differentiates between statements about reality and internal representations of reality, i.e. beliefs. Understanding metaphors, irony, lying and any other ambiguous statement when we need to step out of literal mean-

ing, is a very valuable way to research how children in middle childhood understand mental states (Lalonde & Chandler, 2002; Bialecka-Pikul, in press; Filipowa & Astington, 2008). Moreover, humor comprehension could also be the expression of differentiation between "what you said and what you really meant". Studies by Hoicka and Gattis (2008) showed that, even at the age of 19 months, children differentiate between intentional jokes and unintentional mistakes. Perceiving that other people act intentionally is a fundamental part of theory of mind. Developing understanding of jokes in early and middle childhood, and even in adolescence, has been examined by many authors (Bernstein, 1986; Bariaud, 1988; Cameron, Kennedy & Cameron, 2001; Abrahamsen, 2004; Radomska, 2007). We assume that understanding visual humor (a funny picture) by children, and especially jokes created this way by themselves, is a very inviting and productive way to search for a child's interpretation of people's intentions.

During our two-stage research, we used a procedure which allowed us to describe what kinds of visual and

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Table 1. Tested group

	Boys	Girls	Age	Total
5-year-olds	15	15	5;3–5;9	30
9-year-olds	15	15	9;3–9;9	30
Total	30	30		60

verbal jokes are created by 5- and 9-year-old children, and how the same children understood picture jokes created by their peers. The processes of creating and understanding jokes are usually researched separately. The first was examined, for example, in order to describe humor as a coping tool (e.g. Fuhr, 2002), the second, as a weather-vane for emerging cognitive abilities such as recognizing intentionality and understanding symbolism (for a review of developmental research see: Martin, 2007). In our research we try to reveal the relation between these two processes. Choosing children at the beginning of middle childhood we can search for their explicit knowledge about jokes. It was most interesting to evaluate the agreement between the intention of the joke's author and understanding of the joke by a child who saw the picture. We hypothesize that for peers it would be easier to understand the author's intentions than for non-peers and that older children would reflect on authors' intentions more accurately. The first stage of our study was more directed to discover children's knowledge about a joke, its sources and how it is created, and this enables us to differentiate seven different kinds of visual and verbal jokes. The second main phase consisted in finding how children perceive visual humor constructed by their peers or older/younger children.

Method

Tested Group

We examined randomly selected children who attended preschools and schools in the city of Kraków (see Table 1). Each child was examined individually in a quiet room.

Research Procedure

We prepared a two stage procedure and examined the same children twice (see Table 2).

During a two month break we prepared categories to analyze children's pictures. We used criteria proposed by such authors as Bergson (1977), Passi (1980), Chapman and Foot (1976), Goldstein and McGhee (1983), Radomska (2000), and distinguished seven ways of creating jokes; these categories were used to classify visual as well as verbal jokes created by the tested children (see Table 3). After the first phase, we collected 60 pictures and then we chose 28 most typical ones (4 for each category), always taking two pictures from younger and two from older children. This was assessed by 5 competent judges and we used in

Table 2. Procedure of research

Stage	Task	Instruction
I. Creating jokes	<u>A. Creating picture jokes</u> An experimenter asks a child to construct a funny picture and then to talk with him or her about it. A child has 6 color pencils and a A4 sheet of paper at his/her disposal.	<i>I know a boy who never smiles. I want to prepare a funny book for him. I want to ask you to draw a picture for this book. (When a picture was complete:) What is in this picture? What could make this boy laugh when he sees your picture?</i>
	<u>B. Creating verbal jokes</u> When talking to a child, the experimenter asked her to narrate a funny story and then the child talked about it.	<i>Could you tell me a funny story, something that is really funny, what could make someone laugh? Could it happen? Did you make it up by yourself or did someone tell you the story? Who did?</i>
II. Understanding picture jokes (after two months)	A child saw a picture-book made of 14 drawings collected during the first stage of the research, drawn by younger (7 pictures) and older (7 pictures) children.	<i>This is a book with children's pictures. Look at them and choose the most funny picture. What is funny about this picture?</i>

Table 3. Categories of the means of creating the jokes

The means of creating a joke	Explanation
1 Introducing formal changes	Deformation in a typical presentation of an event or an object (exaggeration, diminution, aesthetic changes, changes in colors)
2 Introducing changes in the meaning	Animating inanimate objects; objectifying people; using objects inappropriately; disguising; taking someone's role
3 Upside-down world	Inversion of a situation; changing roles; snowball effect; circular effect; comparing and contrasting features
4 Introducing the absurd	Absurdity, something against common sense, inconsistency
5 Inducing a surprise	Surprise; something not compatible with the recipient's expectation; unexpected point
6 Showing clumsiness, absent-mindedness	Stumble; rigidity of gesture
7 Replica	Repeating, similarities, imitating

the second stage of our study only those pictures which were chosen by at least 4 judges as good representatives of this category.

Results

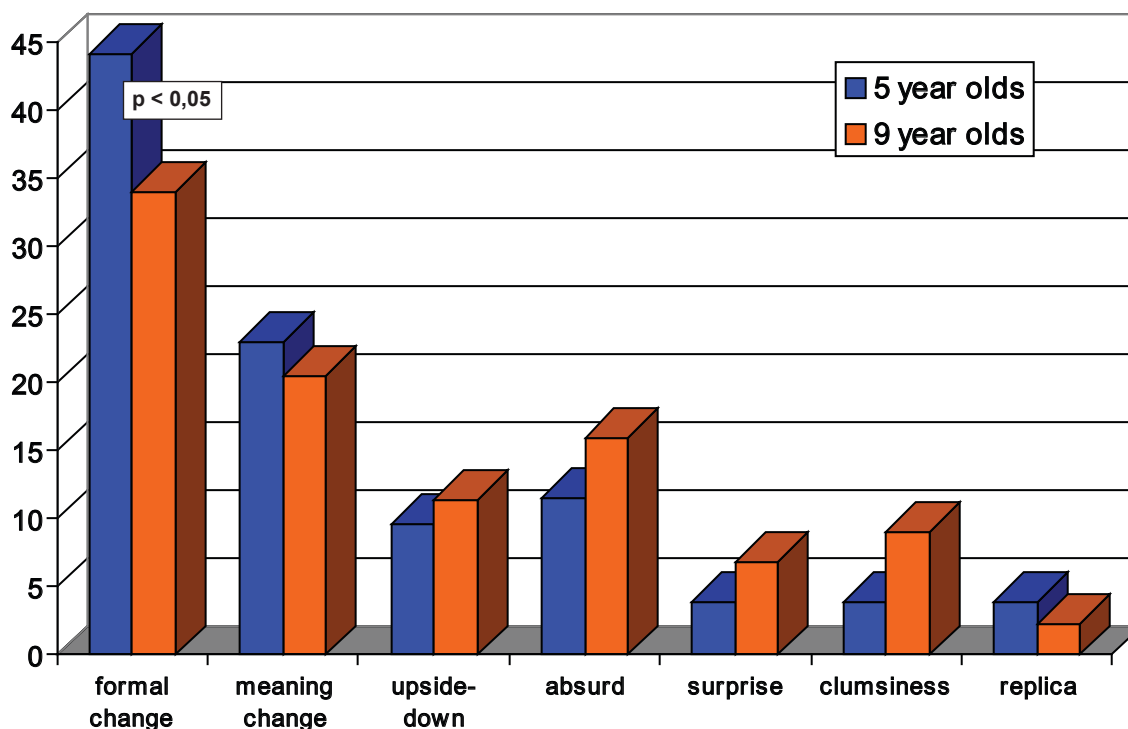
Creating Picture and Verbal Humor

Children from both age groups who drew funny pictures used formal changes as well as changes in the mean-

ing most frequently. Replicating was the least frequently used way to create a joke. There were statistically significant differences in using formal changes between age groups ($\chi^2=4.32$, $p<0.05$, $df=1$). In 5-year-olds we observed significantly more frequent usage of this means when transforming reality to create humor than in 9-year-olds (44% of all jokes in this age group were created this way). These results are presented in Figure 1.

To illustrate this, it is worth presenting a picture with formal changes proposed by Kajetan (picture 1) and compare it with the picture by Kasia (picture 2) who introduces

Figure 1. The number of pictures (in percentage) which used each category of jokes when creating picture



Picture 1. Kajetan (9;5) constructed a humorous picture, using formal changes: *a man – mutant... uneven hands, uneven legs, uneven eyes*



Picture 2. Kasia (9;5) drew a penguin eating an ice-cream, so she used the “upside-down world” transformation.



upside-down world to induce the effect of humor in her picture.

We also discovered some differences between boys and girls who created visual jokes. Although the most frequent category used by both boys and girls was the introduction of formal changes, the least frequent were the replica, gender differences occurred in the two categories. Girls, more frequently than the boys, introduced changes in the mean-

ing ($\chi^2=12.38$, $p<0.05$, $df=1$). and described “upside-down world” in their jokes ($\chi^2=4.32$, $p<0.05$, $df=1$). For example Nina’s (5;9), describing her picture, said: *Here is a dog and a cat. It is funny Because the cat is chasing the dog and wants to eat him...*

When children from both tested groups created verbal jokes, they most frequently used “inducing surprise” (see Figure 2) For example, Michał (9;4) narrated: *A man*

Figure 2. The number of children who create each category of verbal jokes

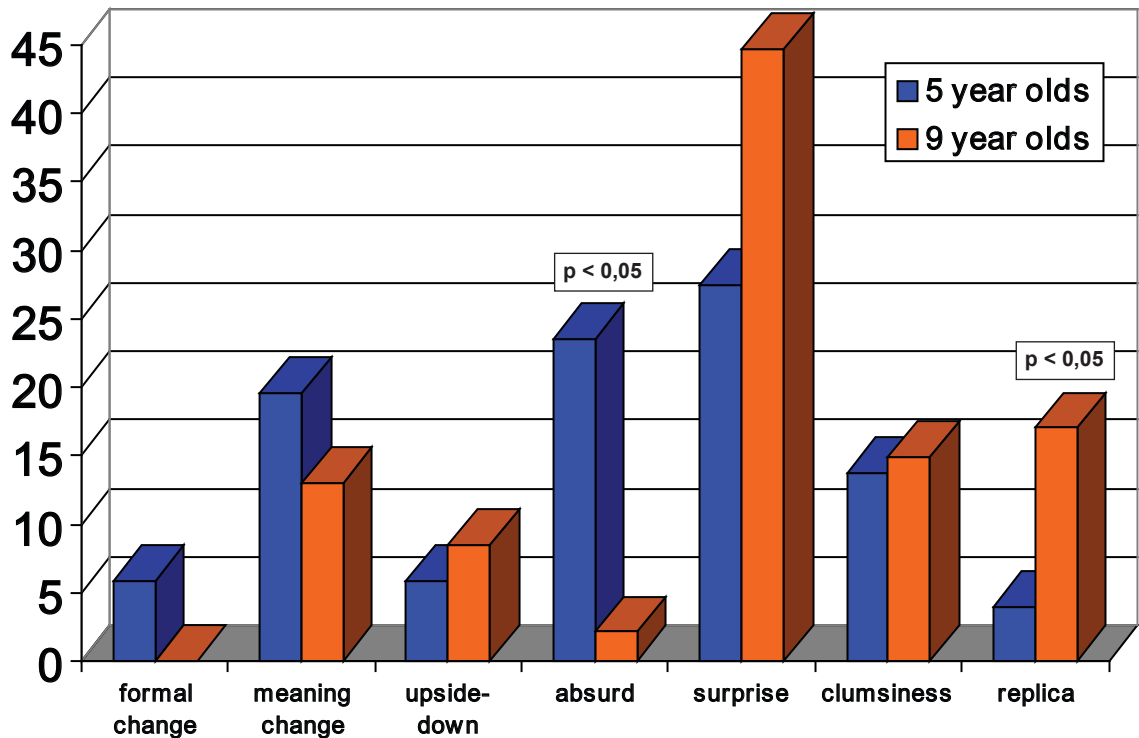
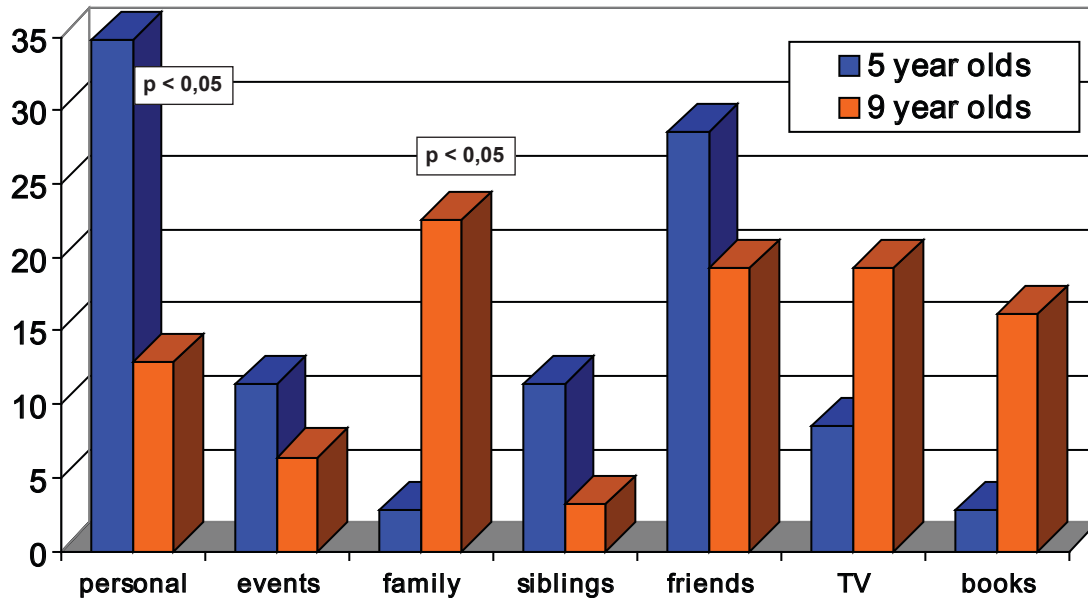


Figure 3. The origins of jokes as told by children



comes to a doctor. I have two bad messages for you: the first one is that you have three days of life left and the other is that I wanted to tell you this a month ago. In contrast to visual jokes, formal changes were least frequent. Age differences occurred in two categories: 5-year-olds more frequently than 9-year-olds introduced elements of the absurd in their jokes ($\chi^2=11.88$, $p<0.05$, $df=1$) and 9-year-olds used replica more frequently ($\chi^2=4.32$, $p<0.05$, $df=1$). The results are especially interesting. On the one hand, they could suggest that introducing absurdity to the statement needs logical discrepancy to be perceived, therefore it will be a more frequently used category by older children. The children probably started to try out logical and mathematical operations in solving problems. It turned out that this category was more frequently used by the younger children. On the other hand, older children used the replica, although it seems to be more characteristic for creating jokes by younger children.

It is also worth emphasizing that when talking with children, the experimenter tends to reveal the origins of jokes told by the children (see Figure 3). It turned out that 5-year-olds more frequently than 9-year-olds stated that they created jokes by themselves ($\chi^2=5.45$, $p<0.05$, $df=1$). In turn, the older children said that someone from the family told them the joke more frequently ($\chi^2=22.58$, $p<0.05$, $df=1$).

Reception of Visual Humor

During the second stage of the research, the children assessed comicality of pictures chosen by competent judges as the most representative of seven distinguished cat-

egories. The differences between 5- and 9-year-olds were found according to the number of chosen humorous pictures. Five-year-olds as a group chosen as humorous 261 pictures, while nine-year-olds only 131 pictures. Moreover, five-year-olds assessed equally frequently as humorous pictures made by their peers as well as made by older children. But nine-year-olds assessed as humorous the picture made by peers more frequently than the ones made by younger colleagues ($\chi^2=13.29$, $p<0.01$, $df=1$).

Most frequently, the children from both age groups found the picture made by a nine-year-old girl the funniest. The author of this picture used the category of clumsiness and absent-mindedness to make the recipient laugh. The pictures presents a piggy that *runs and, with an impetus, hits the wall...and gets a headacheit sees stars* (see Picture 3).



Picture 3. Magdalena's (9;6) picture

Picture 4. Marta's (9;5) picture presents: *The bear does not like honey... that it prefers a banana*



When we compare groups gender differences did not occur as to assessment of the comicality of pictures. But using categories we found that girls more frequently than boys assessed as humorous a picture made by a 9-year-old who used formal changes ($\chi^2=4.44$, $p<0.01$, $df=1$). But boys assessed higher the comicality of a picture with elements of the absurd ($\chi^2=5.4$, $p<0.01$, $df=1$), for example, such as made by 9-year-old Michał who presents: *A fisherman who fishes a cat with a fish as the bait*.

During the first stage of the research, each child gave an explanation why he or she thought his/her picture was funny. During the second stage, the children chose the funniest pictures and also justified their selection. The procedure we used allowed us to find an agreement between the author's intention and the interpretation made by the recipient. This concordance could be, in our opinion, treated as an expression of interpretative theory of mind.

It turns out that children more accurately interpret pictures made by their peers. In 5-year-olds, this relation was found in three categories (formal changes, changes in meaning, upside-down world), and in 9-year-olds in two categories (surprise and clumsiness)¹. For example Karolina (9;9) choose Marta's picture as funny and justifies it thus: *This bear is funny because it has silly ears.....a bit like a rabbitand he is eating something.....a green banana! And he should be eating honey* (see Picture 4).

There is also a relationship between the age of the author of a picture and the number of interpretations which are in agreement with the author's intentions. More 9-year-olds than 5-year-olds interpreted accurately the intention of the author ($\chi^2=26.51$, $p<0.01$, $df=1$). This result points to older children's ability to interpret beliefs and thoughts of the author adequately. Common experience connected with age and a general knowledge about what makes people laugh and why it proves a complex theory of mind in

9-year-olds. Not only are they able to perceive the falsity of beliefs or expectations of others, but they also accurately interpret intentions of the author of ambiguous and funny pictures.

Conclusions

Creating humor needs an orientation in the recipient's mind in order to answer the question: What makes a recipient/listener laugh? To answer this question, a child has to turn attention to the form as well as to the meaning of a statement, or at least to one of these aspects. Therefore, it could be hypothesized that children who are able to create jokes understand that pictures and statements could represent knowledge about the world and that we could reconstruct this knowledge in the pictures (Freeman, 1980; Karmiloff-Smith, 1990). Moreover, these children are also aware of flaws and deviations in representing knowledge about the world in a picture or a statement (Pillar, 1998). Piaget (2003) showed that if a child understands something, he or she tries to reconstruct it. Thus, if a child wants to present his/her images to others, he/she has to understand how the human mind works.

What is funny is not a permanent feature of a situation. It is created in a relation between the stimulus and the subject (author/recipient). That is when in our consciousness intellectual and emotional processes took place the effect is laughter, the expression of humor. Searching an understanding of humor could be the way to reveal how children create their representation of the world, especially of other people who are "thinking machines". We try to examine children in middle childhood and our results could be seen as the continuation of results obtained with children in early childhood (Hoicka, Jutsum, Gattis, 2008). Both these lines of research discover the cognitive function of humor and supports incongruity theories of humor.

Moreover, from the point of view of the development of symbolism even in early childhood, a child's picture has a representative nature. But when a child proceeds to a symbolic activity (Gardner, 1982), the transition from the representative character of a picture to creating a new reality in it could be connected with mix-ups, deformations and/or lack of a plan. This kind of transformation could be used to make humorous presentations of the world. Our research, indeed, revealed that transformations by way of exaggeration or changes in colors were more frequently used by children, especially the younger ones. On the other hand, changes in the meaning, like animating inanimate objects, or objectifying people, or assigning to objects other functions, or disguising, seem to relate to the child's egocentric attitude to reconstructing the image of the world from the human perspective. This manner of transforming the image of the world was also frequently used by younger children, which remains in agreement with a general developmental tendency.

¹ All χ^2 test are significant on $p<0.05$

Introduced to create comicality, transformations in verbal statements were coherent with general developmental tendencies: the younger children introduced deviation from the norm by presenting an upside-down-world, which is in agreement with the rule that "any deviation from the norm intensifies the norm in a child" (Czukowski, 1962). The older children more frequently used replica. This way of creating humor is characteristic of a folk trend in art and it is also very frequently used in children's literature, while repetition is one of the rules of a child's play.

The means of creating humorous products turned out to depend on the material. And so, in their drawings, the children used formal changes more frequently (changes in shape, size, color) but the verbal material did not make changes in the meaning usually by way of surprise. Replicas in pictures turned out not to be an effective way to make people laugh, nor did introducing verbal statements. As for the former, this situation is probably connected with technical reasons, while in the latter the reason is a low linguistic awareness which will increase only during a formal education in the native language.

We found that children notice comicality in the presented pictures, and that the presentation of clumsiness or deformation of the image of the world made the children laugh most often. Therefore, it could be asserted that when a child starts to have at his or her disposal a basic knowledge about the world, he or she is also able to introduce transformations to this knowledge (for the purpose of running mental experiments) and to purposefully use these transformations as a manipulation to introduce an element of amusement because of the perceived disagreements. Using discordance to introduce laughter makes us believe that a child expects the discovery of a discrepancy between the representation of the world and the reconstruction of this representation made by the recipient. We found that, although preschool children have at their disposal a theory of mind, nevertheless the level of its development which allows to predict the reception of humor by the recipient develops in school age.

Our research confirms the well-known hypothesis about the community of laughter (Żygulski, 1976). It turned out that two microenvironments of the family and the peer group have the greatest influence upon a child's acquisition of a sense of humor. The value of the latter was clearly marked in 9-year-olds when interpreting the author's humorous intention in the pictures.

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